

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2018/2019

EME4196 – QUALITY ENGINEERING
(ME/RE)

13 OCTOBER 2018
2.30 p.m. - 4.30 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This Question paper consists of 4 pages with 4 Questions only.
2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

Question 1

- (a) According to Garvin, quality has 9 different dimensions which are somewhat independent of each other. Very few products can have a high score or rating in all the 9 dimensions.

Give an example of a product and discuss the application of the 9 dimensions of quality in your given example.

[9 marks]

- (b) 2 out of the 3 principles for achieving high levels of performance and quality in Total Quality Management (TQM) is related to customers. In order to achieve better customer satisfaction and continuous improvement in performance, one of the TQM strategies is to focus on customer complaints.

Discuss the procedure for effective handling of customer complaints.

[5 marks]

- (c) Describe in your own words the organizational benefits that can be gained from the implementation of ISO 9000 in a manufacturing company.

[3 marks]

- (d) In general, Six Sigma utilizes the DMAIC methodology to improve a current process or make incremental changes to an existing product or process. However, the Design for Six Sigma (DFSS) is often used for the complete re-design of a product or process.

(i) Give a suitable product example and describe the DMADV steps used in DFSS methodology when it is applied in the re-design of your example.

[5 marks]

(ii) List three main tools commonly used in DFSS.

[3 marks]

Continued ...

Question 2

Reasons for Failure in Final Inspection of Car	2017			
	1st	2nd	3rd	4th
Air-conditioning	0	0	1	1
Bonnet	1	1	0	1
Door	8	7	10	7
Engine	7	9	8	9
Lights	1	0	1	0
Paint	8	6	5	5
Suspension	1	1	2	2
Tyres	1	1	2	1
Windshield	2	2	1	2
Wiper	1	0	1	1

(a) The check sheet above shows the reasons for the final inspection failure for a car assembly factory. The data is grouped into 4 quarter months for the year 2017. Analyze the data and construct the Pareto Diagram. Determine the critical (vital few) causes that should be focused upon for further improvement.

[14 marks]

(b) Statistical quality control (SQC) is the application of the statistical and analytical tools to monitor process outputs which are dependent variables. The Cause-Effect Diagram is one of the tools used commonly to identify the root cause of quality issues and problems. Based on your findings from (a), discuss how you would apply the Cause-Effect Diagram to analyze the problem so that possible solutions to the critical causes can be identified.

[11 marks]

Continued ...

Question 3

(a) Reliability can be defined as the ability of a product to perform as expected over time. Assess the 4 factors often associated with reliability and determine how each factor is applicable to a mountain bike.

[8 marks]

(b) One of the main objectives of the Failure Mode and Effect Analysis (FMEA) approach is to take actions to eliminate or reduce potential product failures, starting with the highest-priority ones. This structured approach is a proven effective method of lowering the possibility of failure.

Using a suitable example of a product, describe the 9 steps used to evaluate the product using the FMEA approach.

[17 marks]

Question 4

(a) The top management in a company who function as administrators should first learn to practice quality management theories and models. One of the models combine the theoretical base of Dr. Deming's System of Profound Knowledge with the practical base of the administrative systems of Japanese Total Quality Control. This model is uniquely shaped like a fork. The handle of the fork represents the management's commitment to transformation.

Describe the 10 steps required in the fork handle phase when it is applied in an engineering firm.

[20 marks]

(b) According to the International Organization of Standardization (ISO), there are several potential tangible economy benefits which can be gained from the successful implementation of ISO 14000.

Discuss the relevance of the 5 benefits to a company operating in Malaysia.

[5 marks]

End of Page.